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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/780,325	02/09/2001	Nicholas P. Wilt	3382-56903	6694

26119 7590 11/02/2004

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EXAMINER

HARRISON, CHANTE E

ART UNIT

PAPER NUMBER

2672

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/780,325

Applicant(s)

WILT ET AL.

Examiner

Chante Harrison

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 6 and 8-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6, 8-18 is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This action is responsive to communications: Amendment, filed on 7/15/04.
2. Claims 1-3, 5-6, 8-18 are pending in the case. Claims 1, 6, 11-13 and 15 are independent claims. Claims 1, 6, 11-13 and 15 have been amended. Claims 4, 7, 19-23 have been canceled.

### *Claim Rejections - 35 USC § 101*

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 1 is rejected under 35 U.S.C. 101 because the claimed invention is directed to a method, which merely manipulates an abstract idea, which is non-statutory subject matter.

With respect to independent claim 1, the claim recites "a method of efficiently converting sensory data between a perceptual data representation and a physical data representation . . .". The disclosed invention has a practical application, e.g., performing floating point operations on an item of sensory data. The disclosed invention is within the technological arts, i.e., the disclosed invention uses a sensory reproduction system. However, the steps of the method do not recite any post-computer process activity, i.e., no independent physical acts, and the steps of the method do not recite any pre-computer process activity, i.e., no manipulation of data representing physical objects or activities.

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Therefore, in order to determine if the process is statutory, one must determine what the computer does to achieve a practical application. A process that merely manipulates an abstract idea is non-statutory despite the fact that it might inherently have some usefulness. For such subject matter to be statutory, the claimed process must be limited to a practical application of the abstract idea. Examiner finds no limitation to a practical application for the claimed method. As an illustration of the lack of limitation to a particular, practical application, the method claimed by Applicant could be accomplished by mental steps of one of ordinary skill in the art aided by pencil and paper. The primary boundaries and removal of edges and vertices and collection of gaps are merely an abstract idea. The preamble of the claim is given little weight in establishing a statutory claim when there are no elements in the claim limitations into which the preamble could give substantial meaning of a practical limitation. Therefore, when taken as a whole, the claim recites manipulation of an abstract idea. See *In re Schrader*, 22 F.3d 290, 30 USPQ2d 1455 (Fed. Cir. 1994), and *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. Claims 1-2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul Tucker et al., U.S. Patent 5,926,406, 7/1999, and further in view of Ravi Shankar et al., U.S. Patent 6,351,760, 2/2002.

As per independent claim 1, Tucker discloses performing a plurality of the computationally less expensive floating point operations on an item of the sensory data (col. 11, ll. 33-41); combining results of the plural performed operations to yield an approximation of a result of the power function on the sensory data item (i.e. computing the accessed look up table values to approximate the floating point exponent) (col. 11, ll. 30-43); evaluating the expression using the approximation to provide a converted sensory data item (i.e. the computation of the obtained values is implemented in the lighting machine, which outputs a final color value hence, a converted sensory data item) (abstract; Fig. 4 "176"; col. 5, ll. 20-30; col. 11, ll. 42-43); and reproducing a physical sensation based on the perceptual data representation.

Tucker fails to specifically disclose wherein the combining results of the plural performed operations comprises performing a weighted mathematical combination of the results, where the weighted mathematical combination is from a group comprising a mean, sum and difference, which Shankar discloses (col. 12, ll. 42-64).

It would have been obvious to one of skill in the art to incorporate Shankar's disclosure of a weighted mathematical combination of the results, where the weighted mathematical combination is from a group comprising a mean, sum and difference with the disclosure of Tucker because Tucker teaches using differing floating point

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operations to improve the calculation of exponential values (col. 7, ll. 50-60; col. 11, ll. 25-45).

As per dependent claim 2, Shankar discloses floating point operations taken from a group comprising addition, subtraction, multiplication, square root and reciprocal operations (col. 12, ll. 42-64), which Tucker fails to disclose. It would have been obvious to one of skill in the art to incorporate Shankar's varied floating operations with the disclosure of Tucker because Tucker teaches using differing floating point operations to improve the calculation of exponential values (col. 7, ll. 50-60; col. 11, ll. 25-45).

As per dependent claim 5, Tucker discloses executing a single instruction, multiple data floating point operation instruction to perform a first of the computationally less expensive floating point operations on multiple items of the sensory data together (col. 5, ll. 28-31; col. 6, ll. 40-45; col. 9, ll. 26-33; col. 14, ll. 37-45, 55-60) in view of Shankar.

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***Allowable Subject Matter***

1. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

2. Claims 6 and 8-18 are allowed.

3. The following is an examiner's statement of reasons for allowance: Applicants amended claims to include converting color values of the color pixel data within the range to have the unity gamma in the perceptual color space while leaving color values of the color pixel data outside the range unaltered (claim 6); amended to independent form claim 11, which claims wherein the perceptual color space has a gamma within a range of 1.7 to 2.5, and the perceptual/physical image converter approximates a computationally expensive power function with an exponent also in the range of 1.7 to 2.5 as a weighted mathematical combination of power functions in a similar range composed of addition, subtraction, multiplication, square root and reciprocal operations; amended to independent form claim 12 which claims wherein the perceptual color space has a gamma within a range of 1.7 to 2.5, and the perceptual/physical image converter approximates a computationally expensive inverse power function with an exponent in the range of  $-1/1.7$  to  $-1/2.5$  as a weighted mathematical combination of power functions composed of addition, subtraction, multiplication, square root and

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reciprocal operations; amended to independent form claim 13 which claims wherein the perceptual color space is the sRGB color space, and the perceptual/physical image converter approximates a power function with exponent of 2.4 as a weighted harmonic mean of the functions  $x^{-2}$  and  $x^{-2.5}$  evaluated as the square of the reciprocal and the reciprocal square root, respectively; and amended to independent form claim 15 which claims wherein the perceptual color space is the sRGB color space, and the perceptual/physical image converter approximates an inverse power function with exponent of  $-1/2.4$  as a weighted <sup>0.375</sup> arithmetic mean of the power functions  $x^{0.5}$  and  $x^{0.375}$ , which the prior art fails to disclose.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



***Response to Arguments***

3. Applicant's arguments, see pp. 9, filed 7/15/04, with respect to the rejection(s) of claim(s) 1 under USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Tucker US 5,926,406 and Shankar US 6,351,760.

Applicant's Representative and Examiner previously discussed amendment of claim 1 to overcome a USC 101 issue, in view of all claims being considered in condition for allowance. However upon further consideration amended independent claim 1 was not determined to be in condition for allowance. Thus, the previously discussed USC 101 issue is addressed above with respect to the USC 101 rejection; and the amended claim remains rejected.

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**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chante Harrison whose telephone number is 703-305-3937. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chante Harrison  
Examiner  
Art Unit 2672

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MICHAEL RAZAVI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER